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<110> WEEKS, J. TROY
ROMMENS, CAIUS

<120> REFINED PLANT TRANSFORMATION

<130> 058951-0172

<140> 10/667,145

<141> 2003-09-22

<150> 10/392,301

<151> 2003-03-20

<150> 60/377,597

<151> 2002-05-06

<150> 60/365,527

<151> 2002-03-20

<160> 76

<170> PatentIn Ver. 3.2

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<211> 780

<212> DNA

<213> Aspergillus sp.

<400> 1

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<210> 2

<211> 416

<212> DNA

<213> Solanum tuberosum

<400> 2

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tctcaatagg tagttcttca taagtgaagc tctccttcat agctacactt tctaaaggta 360
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<210> 3

<211> 2595

<212> DNA

<213> Solanum tuberosum

<400> 3

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gaaggtttat atctacttca gaaataacaa tatactttta tcagaacatt caacaaagta 360
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<210> 4
 <211> 292
 <212> DNA
 <213> *Saccharomyces cerevisiae*

<400> 4
 ttcttcgcca gaggtttggt caagtctcca atcaagggtg tcggcttgtc taccttgcca 60
 gaaatttacg aaaagatgga aaaggggtcaa atcggttgga gatacgttgt tgacacttct 120
 aaataagcga atttcttatg atttatgatt tttattatta aataagttat aaaaaaata 180
 agtgtataca aatttttaaag tgactcttag gttttaaaac gaaaattctt attcttgagt 240
 aactctttcc tgtaggtcag gttgctttct caggtatagc atgagggtcgc tc 292

<210> 5
 <211> 359
 <212> DNA
 <213> *Solanum tuberosum*

<400> 5
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 gagttttttt tgctatatgg attttcgttt ttgatgtatg tgacaaccct cgggattggt 120
 gattttatttc aaaactaaga gtttttgctt attgttctcg tctatttttg atatcaatct 180
 tagttttata tcttttctag ttctctacgt gttaaatgtt caacacacta gcaatttggt 240
 tgcagcgtat ggattatgga actatcaagt ctgtggggtc gataaatatg cttctcagga 300
 atttgagatt ttacagtctt tatgctcatt gggttgagta taatatagta aaaaaatag 359

<210> 6
 <211> 626
 <212> DNA
 <213> *Oryza sativa*

<400> 6
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 ttaatgacat gtcacacaca cttctgatac ttttctttct tggctattgt gccagcatga 180
 tgcaagatgc atcacagcat cagatatatt ctcatcgta ggcttttagca gcacacgagc 240
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 cttttcactt ttccttaaac aaattgagag gggaaatgga accatgtgga tcagagaagc 360
 ttttgtttct ttacacaaga atatttggtt cagtgggggt cctatgttcg tgggttcgtg 420
 gcttggctgc ctgtcttcaa ccaagtgttt tcagttcaac atgttagcgt gtagaaagag 480
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 cagtggaaga ggagtgaag ctttct 626

<210> 7
 <211> 492
 <212> DNA
 <213> *Solanum tuberosum*

<400> 7
 aaataacaaa tatcaatatg aggtcaataa caatatcaaa ataatatgaa aaaagagcaa 60
 tacataatat aagaaagaag atttaagtgc gattatcaag gtagtattat atcctaattt 120
 gctaataattt aaactcttat atttaaggtc atgttcatga taaacttgaa atgcgctata 180
 ttagagcata tattaataa aaaaaatacc taaaataaaa ttaagttatt ttagtatat 240
 atttttttac atgacctaca tttttctggg tttttctaaa ggagcgtgta agtgtcgacc 300
 tcattctcct aattttcccc accacataaa aattaaaaag gaaaggtagc ttttgctgtg 360

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tgtttttggt cactacacct cattattaca cgtgtcctca tataattggt taaccctatg 420
aggcgggttc gtctagagtc ggccatgcca tctataaaat gaagctttct gcacctcatt 480
tttttcatct tc 492

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<210> 8
<211> 1026
<212> DNA
<213> Solanum tuberosum

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<400> 8
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cccaaattga atagtaagca acttaatggt tttcataatg ataatgacag acacaaaaaa 120
aaccatttta ttattcacat tgattgaggt ttatatgcaa tataagtaata ataataatat 180
ttcttataaa gcaagagggtc aatttttttt taattataacc aacgtcacta aattatattt 240
gataatgtaa aacaattcaa ttttacttaa atatcatgaa ataaactatt ttataacca 300
aattactaaa tttttccaat aaaaaaaagt cattaagaag acataaaaata aatttgagta 360
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taacctaata aaacactaat ataatttcat ggaatctaata acttacctct tagaaataag 480
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caaatatcaa tatgagggtca ataacaatat caaaataata tgaaaaaaga gcaatacata 600
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ggtacactac acctcattat tacacgtgtc ctcatataat tggttaacct tatgaggcgg 960
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```

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<210> 9
<211> 253
<212> DNA
<213> Artificial Sequence

```

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<220>
<223> Description of Artificial Sequence: Synthetic
promoter sequence

```

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<400> 9
gtcgacaagc aaaggggtatg gcaactgtgt caccgccctt cgctgcgtgt taacggccac 60
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ttccgccttc ccggaacgg cggtgggttc agcgtggcgg attccccctc ccaccacca 180
accgccataa ataccagccc ccacctcact ctctttgcat atccatccaa atcccagtc 240
ccaatcgaat tcc 253

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<210> 10
<211> 300
<212> DNA
<213> Zea mays

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<400> 10
aagcttaata gcttcaccta tataatactt catccatttt attagtacat ccatttaggg 60
tttaggggta atgggttttta tagactaatt ttttttagtac atctatttta ttctatttta 120
gcctctaaat taagaaaact aaaactctat tttagttttt ttatttaata atttagatat 180
aaaatagaat aaaataaagt gactaaaaat taaacaaata ccctttaaga aattaaaaaa 240

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actaaggaaa catttttctt gtttcgagta gataatgcc a gcctgttaaa cgccgtcgac 300

<210> 11

<211> 1425

<212> DNA

<213> Saccharum officinarum

<400> 11

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gaattccctt cgteggagaa attcatcgaa gcgaagcgaa tcctcgcgat cctctcaagg 60
tactgcgagt tttegatccc cctctcgacc cctcgtatgt ttgtgtttgt cgtacgtttg 120
attaggtatg ctttccctgt ttgtgttcgt cgtacggttt gattaggtat gctttccctg 180
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tttggttcat gtatcaattc ttttgtgttc aacagtcagt ttttggttaga ttcattgtaa 1380
cttatgttcg cttactcttc tggctcctcaa tgcttgcagg gatec 1425

```

<210> 12

<211> 729

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
resistance gene nucleotide sequence

<400> 12

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atgtgtcaga acgaagttga agtcaatggc tggaccagca tgccctgcaa tgctggcgcc 60
atctttgggg ataagccttt catcaacgag ccaaaggccc tgtcgattga agagatcaag 120
tttccattcg acgatcctgt cgtcgcaaag acgttggatt atgccaaggc tgttctgcat 180
cctgaaacat tcaatcactc catgcgagta taccactacg gaatggctat cacaagcag 240
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gcagctgccg aggetatcat ccgccatgag gatatgggag ttgacgggac gattacatac 480
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cgacttaagt ggtgcacggt cttttctggt gtcattcgca aggaggagac gatcaagcct 660
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gggcagtga
729

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<210> 13
 <211> 242
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 resistance protein sequence

<400> 13
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 Asn Ala Gly Ala Ile Phe Gly Asp Lys Pro Phe Ile Asn Glu Pro Lys
 20 25 30
 Ala Leu Ser Ile Glu Glu Ile Lys Phe Pro Phe Asp Asp Pro Val Val
 35 40 45
 Ala Lys Thr Leu Asp Tyr Ala Lys Ala Val Leu His Pro Glu Thr Phe
 50 55 60
 Asn His Ser Met Arg Val Tyr His Tyr Gly Met Ala Ile Thr Lys Gln
 65 70 75 80
 Gln Phe Pro Glu Gln Ala Ala Ala Leu Ser Pro Ile Thr Trp Ala Leu
 85 90 95
 Thr Cys Leu Leu His Asp Leu Gly Thr Ala Glu Glu Asn Leu Thr Ala
 100 105 110
 Thr Arg Met Ser Phe Asp Ile Tyr Gly Gly Ile Lys Ala Leu Ser Val
 115 120 125
 Leu Lys Asp Phe Gly Ala Thr Val Asp Gln Ala Glu Ala Ala Ala Glu
 130 135 140
 Ala Ile Ile Arg His Glu Asp Met Gly Val Asp Gly Thr Ile Thr Tyr
 145 150 155 160
 Ile Gly Gln Leu Ile Gln Leu Ala Thr Thr Tyr Asp Asn Thr Gly Phe
 165 170 175
 His Pro His Val Lys Asp Phe Gly Lys Leu Val His Asp Glu Thr Arg
 180 185 190
 Ala Gln Ile Asn Thr Ala Tyr Pro Arg Leu Lys Trp Cys Thr Phe Phe
 195 200 205
 Ser Gly Val Ile Arg Lys Glu Glu Thr Ile Lys Pro Trp Cys His Ser
 210 215 220
 Thr His Leu Val Asp Phe Asp Lys Glu Ile Glu Ala Gly Thr Pro Asp
 225 230 235 240
 Gly Gln

<210> 14
 <211> 729
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 resistance gene nucleotide sequence

<400> 14

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atgtgcca aa acgaggtgga ggtgaacggc tggacctcca tgccagccaa cgccggcgcc 60
atcttcggcg acaagccatt catcaacgag ccaaaggccc tctccatcga ggagatcaag 120
ttcccattcg acgacccagt ggtggccaag accctcgact acgccaaggc cgtgctccac 180
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gccgccgcgc aggccatcat ccgccacgag gacatgggcg tggacggcac catcacctac 480
atcggccaac tcatccaact cgccaccacc tacgacaaca ccggcttcca cccacacgtg 540
aaggacttcg gcaagctcgt gcacgacgag acccgcgccc aaatcaacac cgcctacca 600
cgcctcaagt ggtgcacctt cttctccggc gtgatccgca aggaggagac catcaagcca 660
tggtgccact ccaccacact cgtggacttc gacaaggaga tcgaggccgg cactccagac 720
ggccaatga                                     729

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<210> 15
 <211> 729
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 resistance gene nucleotide sequence

<400> 15

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atgtgtcaga atgaagttga agttaatgga tggacttcta tgccagctaa tgctggagct 60
atctttggag ataagccatt tattaatgaa ccaaaggctc tttctattga agaaattaag 120
tttccatttg atgatccagt tgttgctaag actcttgatt atgctaaggc tgttcttcat 180
ccagaaaactt ttaatcattc tatgagagtt tatcattatg gaatggctat tactaagcaa 240
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ggacaataa                                     729

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<210> 16
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 16

tggtaggata tataccggtg taatt

25

<210> 17

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 17

tggcaggata tatggtactg taatt

25

<210> 18

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220>

<221> modified_base

<222> (16)

<223> a, c, g, t, unknown, or other

<400> 18

ygryaggata tatwsnvbkg taawy

25

<210> 19

<211> 25

<212> DNA

<213> Solanum tuberosum

<400> 19

tgacaggata tatggtaatg taaac

25

<210> 20

<211> 25

<212> DNA

<213> Solanum tuberosum

<400> 20

tggcaggata tataccgatg taaac

25


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<210> 21
<211> 244
<212> PRT
<213> Myrothecium verrucaria
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<400> 21

Met Ser Ser Ser Glu Val Lys Ala Asn Gly Trp Thr Ala Val Pro Val
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Ser Ala Lys Ala Ile Val Asp Ser Leu Gly Lys Leu Gly Asp Val Ser
20 25 30

Ser Tyr Ser Val Glu Asp Ile Ala Phe Pro Ala Ala Asp Lys Leu Val
35 40 45

Ala Glu Ala Gln Ala Phe Val Lys Ala Arg Leu Ser Pro Glu Thr Tyr
50 55 60

Asn His Ser Met Arg Val Phe Tyr Trp Gly Thr Val Ile Ala Arg Arg
65 70 75 80

Leu Leu Pro Glu Gln Ala Lys Asp Leu Ser Pro Ser Thr Trp Ala Leu
85 90 95

Thr Cys Leu Leu His Asp Val Gly Thr Ala Glu Ala Tyr Phe Thr Ser
100 105 110

Thr Arg Met Ser Phe Asp Ile Tyr Gly Gly Ile Lys Ala Met Glu Val
115 120 125

Leu Lys Val Leu Gly Ser Ser Thr Asp Gln Ala Glu Ala Val Ala Glu
130 135 140

Ala Ile Ile Arg His Glu Asp Val Gly Val Asp Gly Asn Ile Thr Phe
145 150 155 160

Leu Gly Gln Leu Ile Gln Leu Ala Thr Leu Tyr Asp Asn Val Gly Ala
165 170 175

Tyr Asp Gly Ile Asp Asp Phe Gly Ser Trp Val Asp Asp Thr Thr Arg
180 185 190

Asn Ser Ile Asn Thr Ala Phe Pro Arg His Gly Trp Cys Ser Trp Phe
195 200 205

Ala Cys Thr Val Arg Lys Glu Glu Ser Asn Lys Pro Trp Cys His Thr
210 215 220

Thr His Ile Pro Gln Phe Asp Lys Gln Met Glu Ala Asn Thr Leu Met
225 230 235 240

Lys Pro Trp Glu

<210> 22
 <211> 259
 <212> PRT
 <213> Aspergillus sp.

<400> 22
 Met Cys Gln Asn Glu Val Glu Val Asn Gly Trp Thr Ser Met Pro Ala
 1 5 10 15
 Asp Ala Gly Ala Ile Phe Asp Gly Gly Pro Phe Ile Asn Val Pro Glu
 20 25 30
 Ala Leu Ser Ile Glu Glu Ile Lys Phe Pro Val Asp Asp Pro Ile Val
 35 40 45
 Glu Lys Thr Met Arg Tyr Ala Lys Ala Ala Leu Pro Thr Glu Thr Phe
 50 55 60
 Asn His Ser Met Arg Val Tyr Tyr Tyr Gly Met Gln Asp Cys Ala Ser
 65 70 75 80
 His Gly Val Leu Ile Asn Arg Ser Gln Ala Leu Gly Met Ala Ile Thr
 85 90 95
 Lys Gln Gln Phe Pro Lys Gln Ala Ser Ala Leu Ser Pro Ser Thr Trp
 100 105 110
 Ala Leu Thr Cys Leu Leu His Asp Ile Gly Thr Ser Asp His Asn Leu
 115 120 125
 Ala Ala Thr Arg Met Ser Phe Asp Ile Tyr Gly Gly Ile Lys Ala Leu
 130 135 140
 Glu Val Leu Lys Gly Phe Gly Ala Thr Ser Asp Gln Ala Glu Ala Val
 145 150 155 160
 Ala Glu Ala Ile Ile Arg His Gln Asp Leu Gly Val His Gly Thr Ile
 165 170 175
 Thr Tyr Ile Gly Gln Leu Ile Gln Leu Ala Thr Ile Tyr Asp Asn Val
 180 185 190
 Gly Ala His Pro Tyr Val Lys Asp Phe Gly Glu Leu Ile His Asp Thr
 195 200 205
 Thr Arg Ser Gln Val His Glu Ala His Pro Pro Gly Glu Trp Arg Thr
 210 215 220
 Phe Phe Ser Gly Val Ile Gln Lys Glu Gln Ala Ile Lys Pro Trp Cys
 225 230 235 240
 His Thr Lys Lys Met Val Asn Val Leu Arg Lys Gly Ser Arg His Pro
 245 250 255
 Asp Gly Gln

<210> 23
 <211> 225
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 23

Met	Ser	Gln	Tyr	Gly	Phe	Val	Arg	Val	Pro	Arg	Glu	Val	Glu	Lys	Ala
1				5					10					15	
Ile	Pro	Val	Val	Asn	Ala	Pro	Arg	Pro	Arg	Ala	Val	Val	Pro	Pro	Pro
			20					25					30		
Asn	Ser	Glu	Thr	Ala	Arg	Leu	Val	Arg	Glu	Tyr	Ala	Ala	Lys	Glu	Leu
		35					40					45			
Thr	Ala	Pro	Val	Leu	Asn	His	Ser	Leu	Arg	Val	Phe	Gln	Tyr	Ser	Val
	50					55					60				
Ala	Ile	Ile	Arg	Asp	Gln	Phe	Pro	Ala	Trp	Asp	Leu	Asp	Gln	Glu	Val
65					70					75					80
Leu	Tyr	Val	Thr	Cys	Leu	Leu	His	Asp	Ile	Ala	Thr	Thr	Asp	Lys	Asn
				85					90					95	
Met	Arg	Ala	Thr	Lys	Met	Ser	Phe	Glu	Tyr	Tyr	Gly	Gly	Ile	Leu	Ser
			100					105					110		
Arg	Glu	Leu	Val	Phe	Asn	Ala	Thr	Gly	Gly	Asn	Gln	Asp	Tyr	Ala	Asp
		115					120					125			
Ala	Val	Thr	Glu	Ala	Ile	Ile	Arg	His	Gln	Asp	Leu	Thr	Gly	Thr	Gly
	130					135					140				
Tyr	Ile	Thr	Thr	Leu	Gly	Leu	Ile	Leu	Gln	Ile	Ala	Thr	Thr	Leu	Asp
145					150					155					160
Asn	Val	Gly	Ser	Asn	Thr	Asp	Leu	Ile	His	Ile	Asp	Thr	Val	Ser	Ala
				165					170					175	
Ile	Asn	Glu	Gln	Phe	Pro	Arg	Leu	His	Trp	Leu	Ser	Cys	Phe	Ala	Thr
			180					185					190		
Val	Val	Asp	Thr	Glu	Asn	Ser	Arg	Lys	Pro	Trp	Gly	His	Thr	Ser	Ser
		195					200					205			
Leu	Gly	Asp	Asp	Phe	Ser	Lys	Lys	Val	Ile	Cys	Asn	Thr	Phe	Gly	Tyr
	210					215					220				

Asn
 225

<210> 24
 <211> 274
 <212> DNA
 <213> *Saccharum officinarum*

<400> 24
aagcaaacgg tatagcaacg gtgttaacct gatctagtga tctcttgcaa tccttaacgg 60
ccacctaccg caggtagcaa acggcgtccc cctcctcgat atctccgcgg cgacctctgg 120
ctttttccgc ggaattgcgc ggtggggacg gattccacaa ccgcgacgca accgcctctc 180
gccgctgggc cccacaccgc tcggtgccgt agcctcacgg gactctttct ccctcctccc 240
ccgttataaa ttggcttcat cccctccttg cctc 274

<210> 25
<211> 240
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
promoter sequence

<400> 25
aagcaaaggg tatggcaact gtgtcaccgc ctttcgctgc gtgttaacgg ccaccaaccg 60
caggtagcaa acggcgtgca ctttcccag atctccacag cgaggtctgg ctttttccgc 120
cttcccggaa accgcggtgg ttccagcgtg gcggattccc cctcccacca cccaaccgcc 180
ataaatacca gccccacct cactctcttt gcatatccat ccaaattcca gtccccaatc 240

<210> 26
<211> 25
<212> DNA
<213> Agrobacterium sp.

<400> 26
tgacaggata tattggcggg taaac 25

<210> 27
<211> 25
<212> DNA
<213> Agrobacterium sp.

<400> 27
tggcaggata tattgtggtg taaac 25

<210> 28
<211> 25
<212> DNA
<213> Agrobacterium sp.

<400> 28
tggcaggata tataccgttg taatt 25

<210> 29
<211> 25
<212> DNA
<213> Agrobacterium sp.

<400> 29
cggcaggata tattcaattg taatt 25

<210> 30
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 30
 tctagatgtc acagtacgga tttgtaag

28

<210> 31
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 31
 ggtcacctca ctgcccata gggtgccggc ttc

33

<210> 32
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 32
 atgtgtcaga acgaagttga agt

23

<210> 33
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 33
 tctagatgtg tcagaacgaa gttgaag

27

<210> 34
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 34

gtatactcgc atggagtgat tg

22

<210> 35

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 35

gtataccact acggaatggc tatcacaaag cagcag

36

<210> 36

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 36

ctgcagtcac tgcccatcag ggggtg

25

<210> 37

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 37

ccaacggatg gactgccgtt ccagtc

26

<210> 38

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 38
catggagtga ttgtaggttt cgggac

26

<210> 39
<211> 93
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 39
tctagaatgt gccaaaacga ggtggaggtg aacggctgga cctccatgcc agccaacgcc 60
ggcgccatct tcggcgacaa gccattcatc aac 93

<210> 40
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 40
gtagtgcagg gtcttggcca ccactgggtc gtcgaatggg aacttgatct cctcgatgga 60
gagggccttt ggctcgttga tgaatggctt gtcgccgaag 100

<210> 41
<211> 99
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 41
gtggtggcca agaccctcga ctacgccaaag gccgtgctcc acccagagac cttcaaccac 60
tccatgcgcg tgtaccacta cggcatggcc atcaccaag 99

<210> 42
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 42
gaggtcgtgg aggaggcagg tgagggccca ggtgattggg gagagggcgg cggcttgctc 60
tggaattgt tgcttggtga tggccatgcc gtagtg 96

<210> 43
 <211> 99
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 43
 ctcacctgcc tctccacga cctcggcacc gccgaggaga acctcaccgc caccgcatg 60
 tccttcgaca tctacggcgg catcaaggcc ctctccgtg 99

<210> 44
 <211> 78
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 44
 gcctcggcgg cggcctcggc ttggtccacg gtggcgccga agtccttgag cacggagagg 60
 gccttgatgc cgccgtag 78

<210> 45
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 45
 tctagaatgt gccaaaacga ggtg 24

<210> 46
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 46
 gcctcggcgg cggcctcggc ttggtc 26

<210> 47
 <211> 98
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 47
 gccgccgagg ccacatccg ccacgaggac atgggcgtgg acggcaccat cacctacatc 60
 ggccaactca tccaactcgc caccacctac gacaacac 98

<210> 48
 <211> 95
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 48
 gtgttgattt gggcgcggtg ctgctcgtgc acgagcttgc cgaagtcctt cacgtgtggg 60
 tggaagccgg tgtgtcgtga ggtgggtggcg agttg 95

<210> 49
 <211> 100
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 49
 gacgagaccc ggcgccaat caacaccgcc taccacgcc tcaagtgggtg caccttcttc 60
 tccggcgtga tccgcaagga ggagaccatc aagccatggt 100

<210> 50
 <211> 97
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 50
 ctgcagtcac tggccgtctg gggcgccggc ctgatctcc ttgtcgaagt ccacgagggtg 60
 ggtggagtgg caccatgggt tgatgggtctc ctcttg 97

<210> 51
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 51
 gccgccgagg ccatcatccg ccacg 25

<210> 52
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 52
 ctgcagtcac tggccgtctg gagtg 25

<210> 53
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 53
 atgtgtcaga atgaagttga agttaatgga tggacttcta tgccagctaa tgctggagct 60
 atctttggag ataagccatt tattaatgaa ccaaag 96

<210> 54
 <211> 90
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 54
 caagagtctt agcaacaact ggatcatcaa atggaaactt aattttcttca atagaaagag 60
 cctttgggtc attaataaat ggcttatctc 90

<210> 55
 <211> 93
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 55

gatccagttg ttgctaagac tcttgattat gctaaggctg ttcttcatcc agaaactttt 60
aatcattcta tgagagttta tcattatgga atg 93

<210> 56

<211> 87

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 56

gggcccaagt aattggagaa agagcagcag cttgttctgg aaattggtgc ttagtaatag 60
ccattccata atgataaact ctcatag 87

<210> 57

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 57

ggatccatgt gtcagaatga agttgaag 28

<210> 58

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 58

gggcccaagt aattggagaa agagc 25

<210> 59

<211> 96

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 59

gggcccttac ttgtcttctt catgatcttg gaactgctga agagaatctt actgctacta 60
gaatgtcttt tgatatttat ggaggaatta aggctc 96

<210> 60

<211> 97

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 60

catgtctaata aatagcttca-gcagcagctt cagcttgatc aacagtagct ccgaaatcct 60
taagaacaga aagagcctta attcctccat aaatatac 97

<210> 61

<211> 98

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 61

gctgctgaag ctattattag acatgaagat atgggagttg atggaactat tacttatatt 60
ggacaactta ttcaacttgc tactacttat gataatac 98

<210> 62

<211> 98

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 62

gcagtattaa ttgagccct agtttcatca tgaacaagtt taccaaaatc cttaacatgt 60
ggatgaaatc cagtattatc ataagtagta gcaagttg 98

<210> 63

<211> 96

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 63
 gaaactaggg ctcaaattaa tactgcttat ccaagactta agtggtgtac attcttttct 60
 ggagttatta gaaaggaaga aactattaag ccatgg 96

<210> 64
 <211> 98
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 64
 gagctcttat tgtccatctg gagttccagc ttcaatttcc ttatcaaaat caacaagatg 60
 agtagaatga caccatgggt taatagtttc ttcctttc 98

<210> 65
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 65
 gggcccttac ttgtcttctt catg 24

<210> 66
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 66
 gagctcttat tgtccatctg gagt 24

<210> 67
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 67
 gtccaacttg cacaggaaag ac 22

<210> 68
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 68
 catggatgaa atactcctga gc

22

<210> 69
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 69
 cacgctaagt gccggccgtc cgag

24

<210> 70
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 70
 tcctaatacga cggcgcaccg gctg

24

<210> 71
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 71
 ggatcctcgt catttacttt tatcttaatg agc

33

<210> 72
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 72

gaattcacat tataagcttt atattaccaa gg

32

<210> 73

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 73

aagcttaata gcttcaccta tataata

27

<210> 74

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 74

gtcgaaggcg tttaacaggc t

21

<210> 75

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 75

gaattccctt cgtcggagaa attcatcgaa g

31

<210> 76

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 76

ggatccctgc aagcattgag gaccag

26